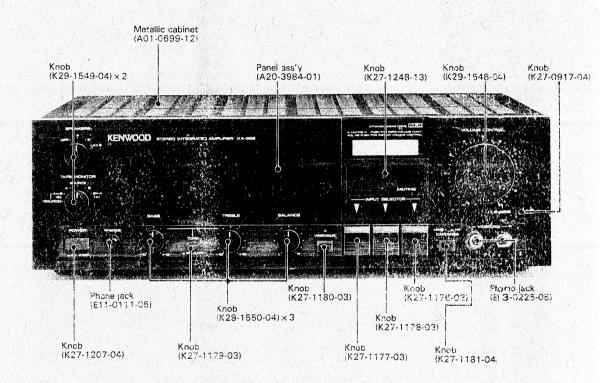
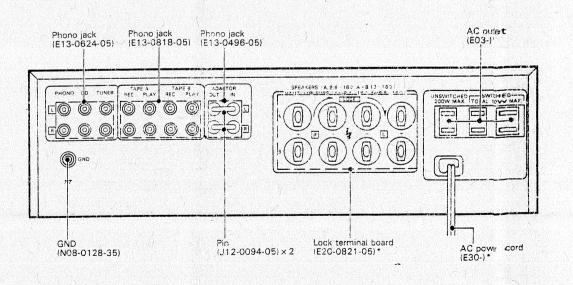
# KENWOOD NA-U

### STEREO INTEGRATED AMPLIFIER

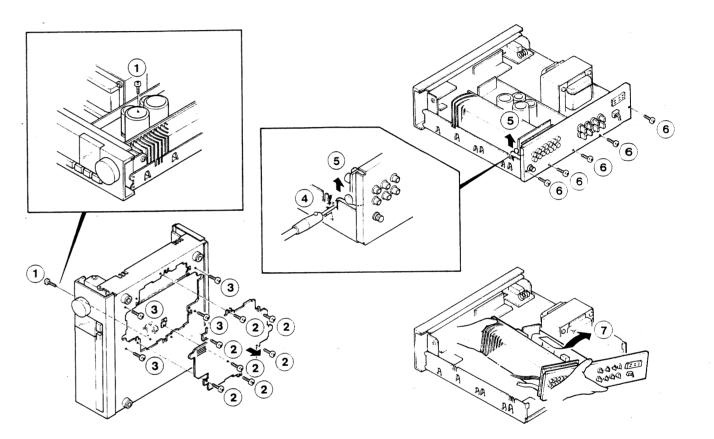




# KA-828

## **DISASSEMBLY FOR REPAIR**

- Removal of Power Amplifier pcb (X07-2150-11)
- 1. Remove the metallic cabinet and a screw near the electrolytic capacitors C13 and C14. (1)
- Remove the bottom plate and 4 screws retaining the mounting hardware to the chassis from the bottom side. (②, ③)
- 3. Unsolder the lead of the capacitor between the chassis and the rear panel. (4), (5)
- 4. Remove 5 screws retaining the rear panel to the chassis.  $(\mbox{\Large \^{6}})$
- 5. The power amplifier pcb, with the rear panel and mounting hardwares, can be separated from the rest. This allows the components to be replaced easily. (⑦)

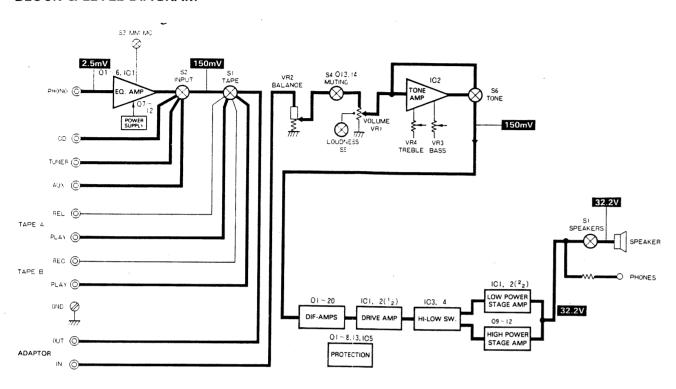


2



## **BLOCK & LEVEL DIAGRAM/CIRCUIT DESCRIPTION**

### **BLOCK & LEVEL DIAGRAM**



### **CIRCUIT DESCRIPTION**

	Circuit No.	Appliction and function	Operation and conditions
	Q1-8	Current limiter	Final protection when driving with overload.
	Q9-12	Final	Five leads with two chips
<del>-</del>	Q13	Protection driver	Turns off relay when the current limiter goes into operation.
20	Q14	Lamp driver	
-21	IC1, 2	Power IC	
X07	IC3, 4	Switching IC	Comparison/switching of high/low of the DLD
^	IC5	Protection IC	Switches off relay when the amp becomes abnormal.
	D1, 2	Rectifying diodes	
	IC1	Equalizer amp	
	IC2	Tone amp	
	Q1-4	Equalizer input differential amp	
	Q5, 6	Equalizer input differential amp for constant current	
150-0	Q7, 8	Stabilized power supply for the equalizer amp	
X08-2150-00	Q9, 10	Constant current for stabilized power supply for equalizer amp	
	Q11, 12	First off for stabilized power supply for equalizer amp	Setting -B to 0 V faster than +B
	Q13, 14	Muting	Mutes for several hundreds msec after power relay is switched ON. Effects muting until power relay turns off after power switch is turned off (to protect power relay).

## ADJUSTMENT/REGLAGES/ABGLEICH

### **ADJUSTMENT**

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	-	Connect a DC voltmeter across TP13,14 (L) TP15,16 (R)	VOLUME: 0	VR1 (L) VR2 (R)	20mV	(a)

#### REGLAGES

		REGLAGE DE	REGLAGE DE	REGLAGE DE	POINS		
N.	ITEM	L'ENTREE	LA SORTIE	L'AMPLIFICATEUR	L'ALIGNEMENT	ALIGNER POUR	FIG.
1	COURANT DE POLARISATION	-	Connecter un voltmètre de CC sur TP13,14 (G) TP15,16 (D)	volume: o	VR1 (G) VR2 (D)	20 <b>s</b> V	(a)

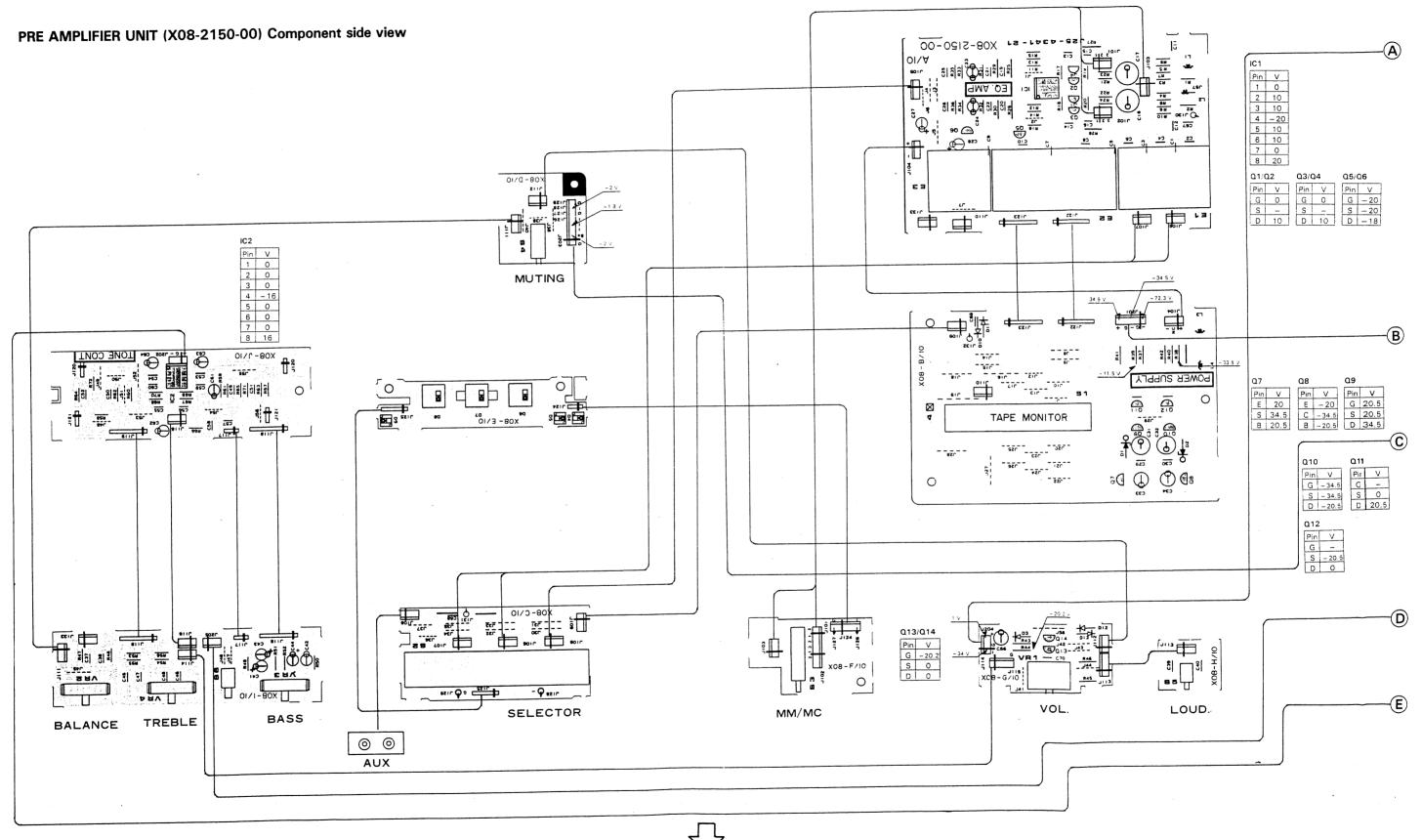
### **ABGLEICH**

NR.	GEGENSTAND	EINGANGS- EINSTELLUNG	AUSGANGS- Einstellung	VORSTÄRKER Einstellung	ABGLEICH- Punkte	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	-	Einen Gleichspannungs- messer über TP13,14 (L) TP15,16 (R) anschließen	VOLUME: 0	VR1 (L) VR2 (R)	20 m V	(a)

3

## KA-828 KA-828

### PC BOARD



**KENWOOD** 

2SA1110 2SC2590

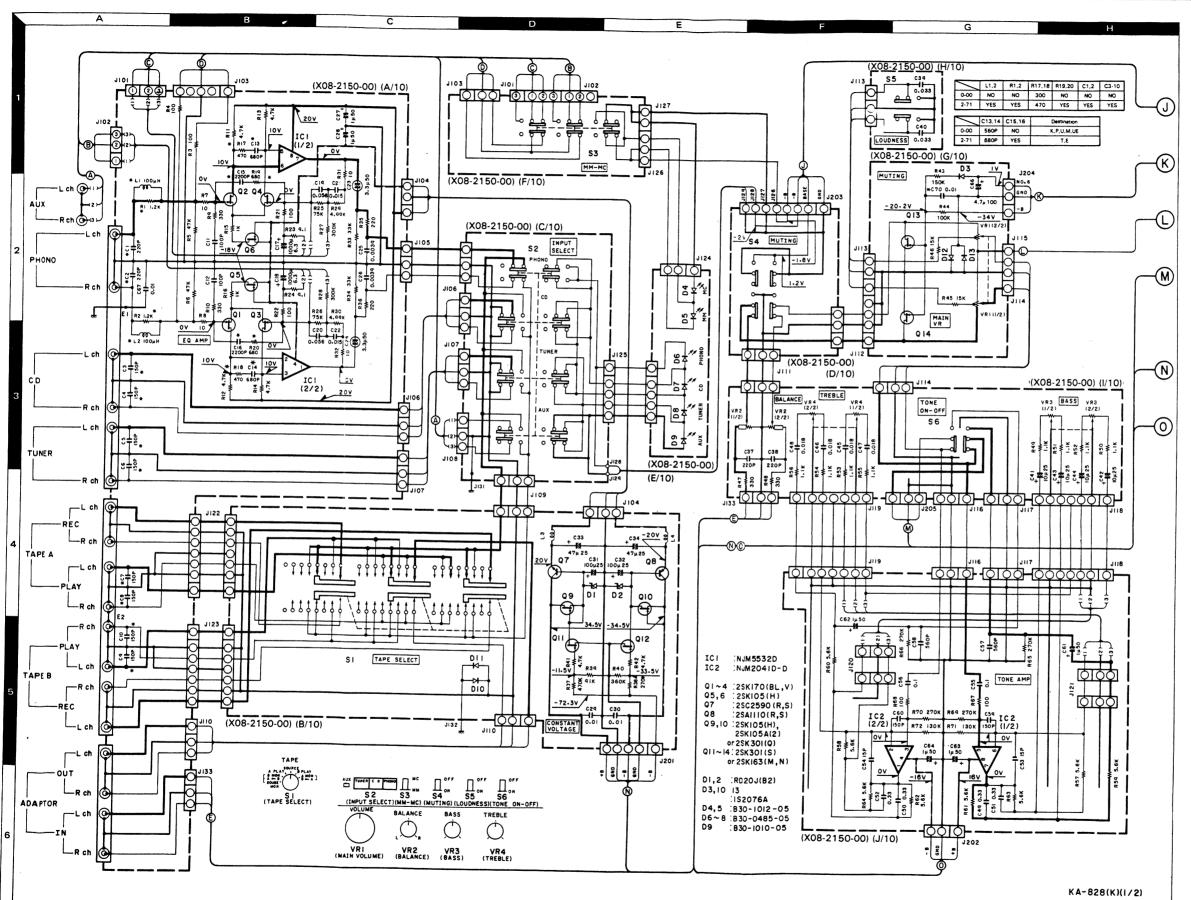
2SK105

2SK105A

2SK163 2SK170

### STEREO INTEGRATED AMPLIFIER

# MA-828





### **Specifications**

Power Amplifier Section

SPEAKER output

Power Output
130 watts\* per channel minimum RMS, both channels
driven at 8 ohms from 20 Hz to 20,000 Hz with no more
than 0.007% total harmonic distortion.

Both Channels Driven into 8 ohms at 1 kHz 0.001% .......150 W+150 W Total Harmonic Distortion (20 Hz to 20,000 Hz) CD, VIDEO/AUX input to

.........0.007% at rated power into 8 ohms 0.007% at 1/2 rated power

 Maximum Input Level for Phono
 MM
 .200 mV (RMS), T.H.D. 0.007%

 at 1,000 Hz
 .17 mV (RMS), T.H.D. 0.007%

 at 1,000 Hz
 .200 mV (RMS), T.H.D. 0.007%

 Bess
 ± 10 dB at 100 Hz

 Troble
 ± 10 dB at 10 kHz

 Loudness Control
 (at −30 dB VOLUME Level)
 + 6 dB at 100 Hz

General

Output Level/Imp

250 W (others)
25 W (no signal)

AC Outlets Switched 2, Unswitched 1
(Except European/Australian countries)

.6.5 A (U.S.A. and Canada)

 Nimensions
 W: 340 mm (13-13/32)

 H: 109 mm (9-7/32)
 D: 369 mm (14-17/32)

 Veight (Net)
 9.2 kg (20.3 lb)

tion rule on Power Output Claims for Amplifier in U.S.A.

Kenwood follows a policy of continuous adv<sub>in</sub> cements in development. For this reason specifications may be changed without notice.

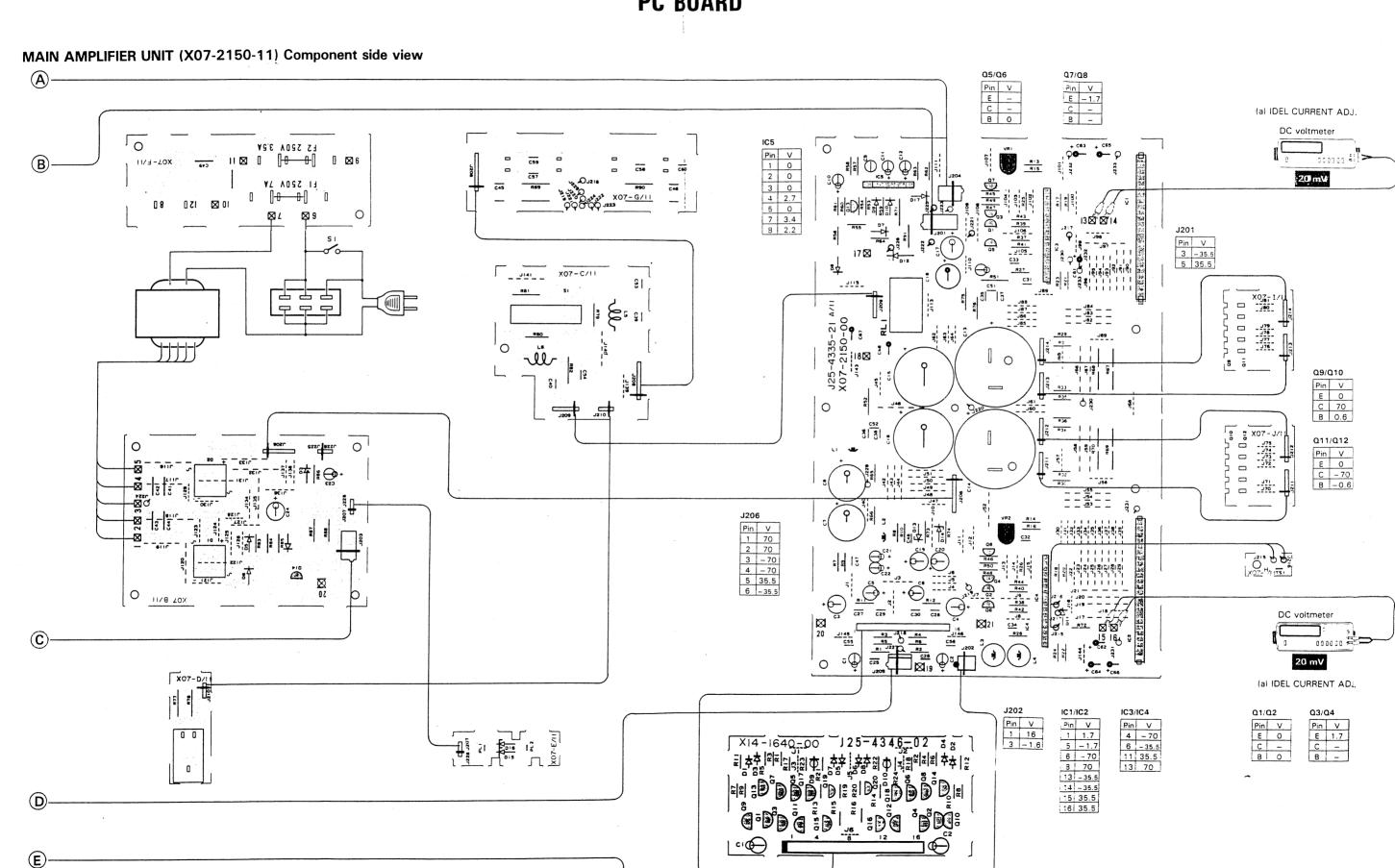
\* Measured pursuant to Federal Trade Commission's TradeRegula-

Kenwood poursuit une politique de progrès constants en ce qui doncerne le développement. Pour cettera ison, les spécifications sont sujettes à modifications sars préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an Daher bleiben Änderungen der tehn nischen Daten jederzeit vorbehalten.

DC voltages are as measured with a high inpedance voltmeter with no signal input. Values nay vary slightly due to variations between individual instruments or/and units.

## KA-828 KA-828 PC BOARD



MODULATION UNIT (X14-1640-00)

Component side view

Refer to the schematic diagram for the values of resistors and capacitors.

The PC board drawing is viewing from the side easy to check.

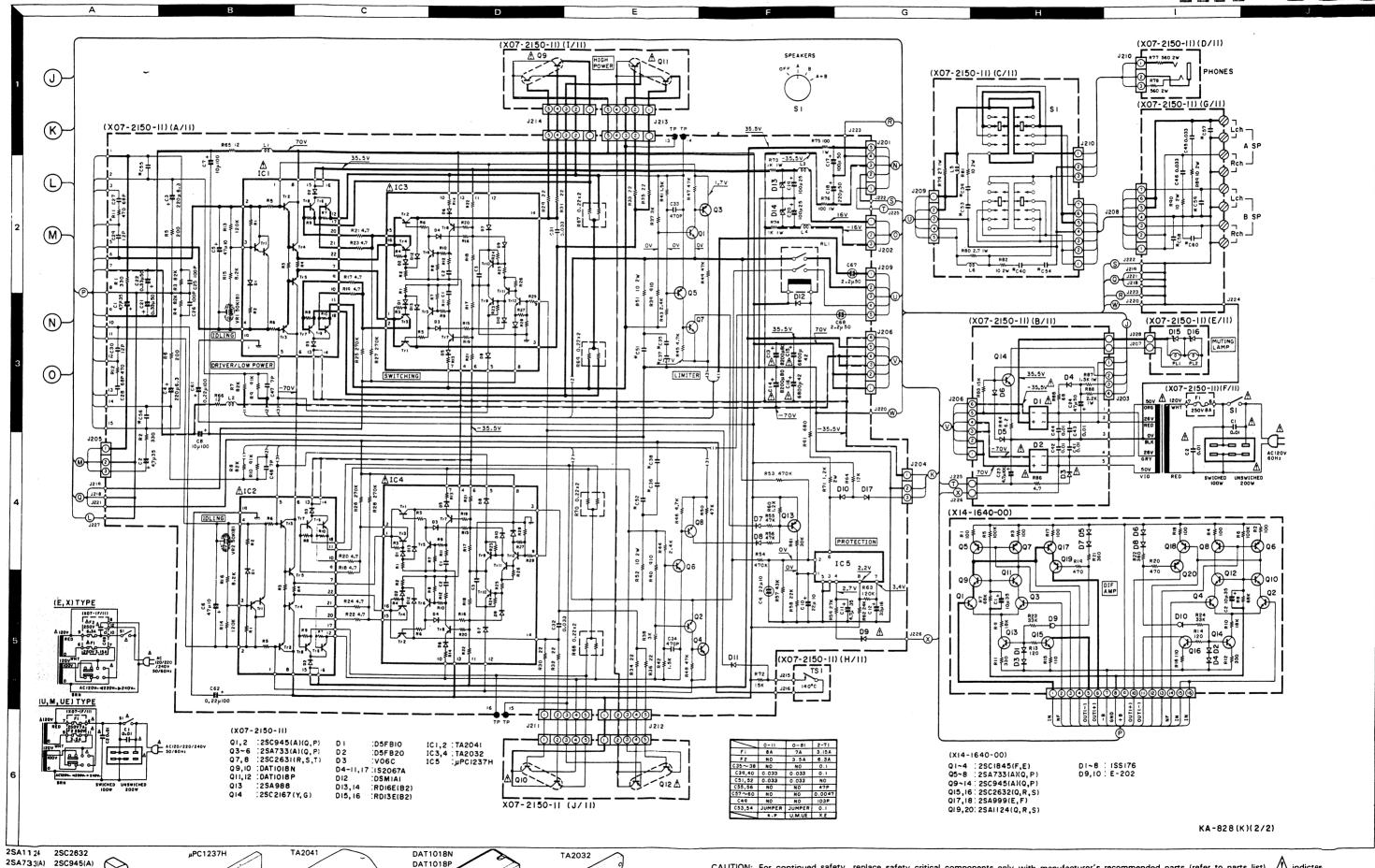
2SA988

2SA999

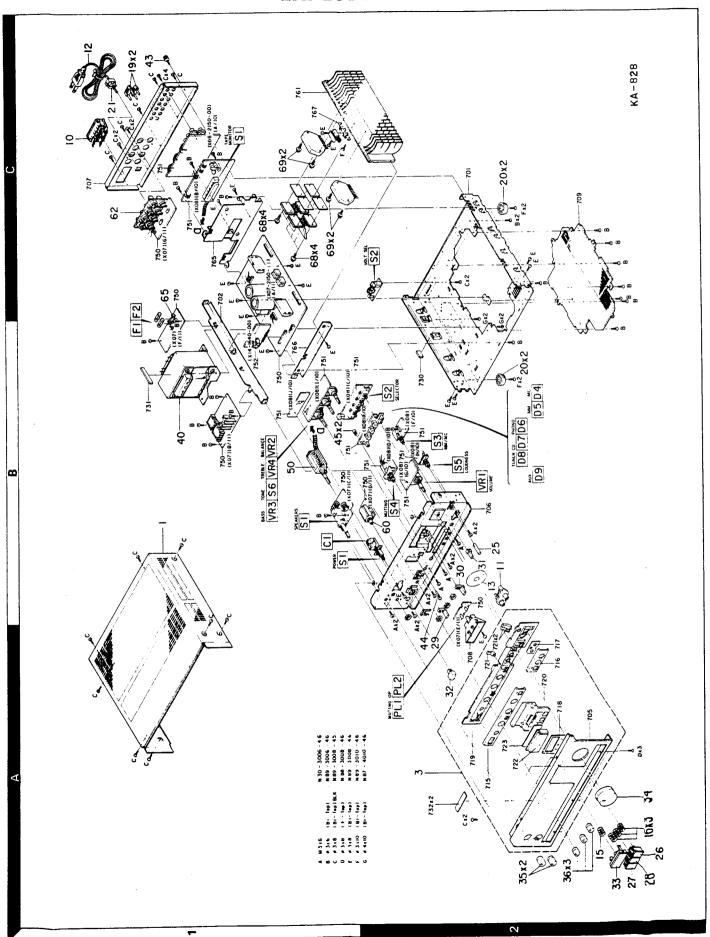
2SC1845

### STEREO INTEGRATED AMPLIFIER





## **EXPLODED VIEW**





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ſ	Ref.	No.	Addr	ess		Parts	No.	Description	Desti- nation	Re-
	参照	番号	位	置	Parts 新	部品	番号	部品名/規格		備考
ľ			<u> </u>					KA-828		
	1 3		1A 2A		*	A01-0699 A20-3984		METALLIC CABINET PANEL ASSY	-	
						B46-0092 B46-0093 B46-0094 B46-0095 B46-0096	303 03 503	WARRANTY CARD WARRANTY CARD WARRANTY CARD WARRANTY CARD WARRANTY CARD	K P U <u>UE</u> U <u>UE</u> X	
					* * * *	846-0098 850-5180 850-5181 850-5182 850-5183	)00 (00 ?00	WARRANTY CARD INSTRUCTION MANUAL(ENGLISH) INSTRUCTION MANUAL(FRENCH) INSTRUCTION MANUAL(G.D.I) INSTRUCTION MANUAL(SPANISH)	E PMXE E M	
	- - -					858-0222 858-0223 858-0245 858-0269 859-0092	3-04 5-23 7-04	CAUTION CARD (PRESET 220V) CAUTION CARD (PRESET 120V) CAUTION CARD CAUTION CARD SERVICE DIRECTORY	UE U E K UUE	
Δ Δ	C1 C1		1B 1B			C91-0023		CERAMIC 0.01UF AC250V CERAMIC 0.01UF P	UM <u>UE</u> KP	
Δ Δ Δ	10 10 11 12 12		10 10 28 10 10		*	E03-0061 E03-006 E13-0225 E30-018 E30-0580	1-05 5-05 1-05	AC BUTLET AC BUTLET PHOND JACK AC POWER CORD AC POWER CORD	KPUM UE K E	
<u>∧</u> <u>∧</u>	12 12 12		1C 1C 1C			E30-0685 E30-0780 E30-134	<b>)</b> -05	AC POWER CORD AC POWER CORD AC POWER CORD	UM <u>UE</u> P X	
	13		2B			F19-0295	504	BLIND PLATE		
	15 16		2A 2A		*	G01-048' G01-1452		COMPRESSION SPRING(MUTING) COMPRESSION SPRING(TUNER,CD,PH		
					* * * * *	H01-518- H10-172: H10-173 H10-173: H25-007	5-13 1-02 2-02	ITEM CARTON CASE POLYSTYRENE FOAMED FIXTURE POLYSTYRENE FOAMED FIXTURE POLYSTYRENE FOAMED FIXTURE PROTECTION BAG (235X315)		
						H25-021	5-04	PRØTECTIØN BAG (CØVER)		
Δ	19 20 21		10 28 10	,20		J12-009 J02-012 J42-008 J61-030	9-05 3-05	PIN ADAPTOR SHORT PIN FOOT POWER CORD BUSHING WIRE BAND	e torte engress.	- Angley was
	25 26 27 28 29		2B 2A 2A 2A 2A		* * *	K27-091 K27-117 K27-117 K27-117 K27-117	6-03 7-03 8-03	KNDB(BUTTON) LOUDNESS KNOB(BUTTON) PHONO KNOB(BUTTON) TUNER KNOB(BUTTON) CD KNOB(BUTTON) TONE ON/OFF		
	30 31 32 33 34		2B 2B 2A 2A 2A	ı	* * *	K27-118 K27-119 K27-120 K27-124 K29-154	1-04 7-04 8-13	KNOB(BUTTON) AUX KNOB(BUTTON) CARTRIDGE MM/MC KNOB(BUTTON) POWER KNOB(BUTTON) MUTING KNOB VOLUME		

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<u>UE</u>: AAFES(Europe)

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٢	Ref. No.	Address	New	Parts No.	Description	Desti- Re-
	参照番号	位 置	Parts 新	部品番号	部 品 名 / 規 格	仕 向 備考
	35 36	2A 2A	*	K29-1549-04 K29-1550-04	KNOB SPEAKERS, TAPE MONITOR KNOB BASS, TREBLE, BALANCE	
2	40 40 40	1B 1B 1B	*	L01-2481-05 L01-3586-05 L01-3586-05	POWER TRANSFORMER POWER TRANSFORMER POWER TRANSFORMER	KP UM <u>UE</u> X E
	43 44 45	1C 2A 1B		NOB-0128-35 NO9-0292-05 N29-0216-05	BINDING POST GND STEPPED SCREW Ø3X19 RIVET LED UNIT	
A A A	50 S1 S1 S1 S2	18 18 18 18 18	*	\$90-0076-05 \$40-1015-05 \$40-1073-05 \$40-1073-05 \$31-2082-05	REMOTE SWITCH SHAFT(TAPE) PUSH SWITCH (POWER) PUSH SWITCH (POWER) PUSH SWITCH (POWER) SLIDE SWITCH (VOLTAGE SEL)	P KUM <u>UE</u> XE UM <u>UE</u> X
Δ	52	2C		531-2082-05	SLIDE SWITCH (VOLTAGE SEL)	
			1	T 1005 05	FIER (X07-2150-11)	
	PL1 ,2 C1 ,2 C3 ,4 C5 ,6 C7 ,8		*	CED4FW1V4R7MEL	ELECTR® 4.7UF 35WV ELECTR® 22OUF 6.3WV ELECTR® 47UF 10WV ELECTR® 10UF 100WV NP-ELEC 22UF 10WV	
Δ	A CONTRACTOR OF THE CONTRACTOR			CE04FW1A220MEL CE04FW1V4R7MEL CE04FW1C330MEL C90-0572-05 C90-0468-05	ELECTR® 22UF 10WV ELECTR® 4.7UF 35WV ELECTR® 33UF 16WV ELECTR® 8200UF 80WV ELECTR® 6800UF 42WV	
	C17 C18 C19 C21 -22 C23	-		CE04FW1H101MEL CE04W1H221MEL CE04FW1E101MEL CE04FW2AR33MEL CE04FW2A4R7MEL	ELECTR® 100UF 50WV ELECTR® 220UF 50WV ELECTR® 100UF 25WV ELECTR® 0.33UF 100WV ELECTR® 4.7UF 100WV	
	C24 C25 ,26 C27 ,28 C29 ,30 C31 ,32		3	* CE04FW1H470MEL C009FS1H101JZS CC45FSL1H680J CC45FSL1H120J CF92FV1H333J	ELECTR® 47UF 50WV P®LYSTY 100PF J CERAMIC 68PF J CERAMIC 12PF J MF 0.033UF J	-
	C33 ,34 C35 -40 C39 ,40 C39 ,40 C41 -44			CC45FSL1H471J CF92FV1H104J CF92FV1H333J CF92FV1H333J CK45E2H103P	CERAMIC 470PF J MF 0.10UF J MF 0.033UF J MF 0.033UF J CERAMIC 0.01UF P	XE KPUM <u>UE</u>
۷	C45 ,46 C47 ,48 A C49 C51 ,52 C51 ,52		. ye.e	CF92FV1H333J CC45FSL1H070D CC91-0647-05 CF92FV1H333J CF92FV1H333J	MF 0.033UF J CERAMIC 7.0PF D CERAMIC 0.01UF P MF 0.033UF J MF 0.033UF J	XE KPUM <u>UE</u>
	053 ,54 055 ,56 057 -60 061 ,62 061 ,62			CF92FV1H104J CC45FSL1H470J CK45FB1H472K CE04FW2AR22MEL CE04FW2AR22MEL	MF 0.10UF J CERAMIC 47PF J CERAMIC 4700PF K ELECTRO 0.22UF 100WV ELECTRO 0.22UF 100WV	XE XE XE UMUE XE
	C63 -66			* CEO4FW2AR47MEL	ELECTRO 0.47UF 100WV	KP

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Ref.	No.	Address		Parts No.	Description	Desti- nation	Re-
参照	番号	位置	Parts 新	部品番号	部品名/規格		備考
067	. 68			CEO4HW1H2R2MEL	NP-ELEC 2. 25F 50WV		
60 62		28 10	*	E11-0111-05 E20-0821-05	PHONE JACK (HEADPHONE) LOCK TERMINAL BOARD(SPEAKERS)		
F1 F1 A F1 A F2 A F2		1C 1C 1C 1B 1B		F05-3121-05 F05-7025-05 F05-8029-05 F05-3523-05 F05-6321-05	FUSE (SEMK®) 250V T3.15A FUSE (UL) 250V BA FUSE (SEMK®) 250V T6.3A	XE UMUE KP UMUE XE	
65 65 65		10 10 10		J13-0041-05 J13-0041-05 J13-0054-05	FUSE CLIP FUSE CLIP FUSE CLIP	KPUM <u>UE</u> XE	
L1 L5	4 •6			L33-0275-05 L39-0080-15	CHOKE COIL PHASE-COMPENSATION COIL		
68 69		10 10		NO9-1202-05 NO9-1236-05	TAPPING SCREW (Ø3X14)FINAL TR TAPPING SCREW (Ø3X16)IC		
R17 R29 R51 R65 R67	-36 •52 •66		* * *	RD14AB2E4R7JTS RD14AB2E22OJTS RS14DB3D10OJ RD14AB2E12OJTS R90-0195-05	FL-PR00F RD 4.7 J 1/4W FL-PR00F RD 22 J 1/4W FL-PR00F RS 10 J 2W FL-PR00F RD 12 J 1/4W METAL-PLATE 0.22 K 5W		
R71 R73 R75 R77 R77	,76 ,78		*	RS14KB3D122J RS14DB3A102J RS14DB3A101J RS14KB3D561J RS14DB3A2R7J	FL-PR00F RS 1.2K J 2W FL-PR00F RS 1.0K J 1W FL-PR00F RS 100 J 1W FL-PR00F RS 560 J 2W FL-PR00F RS 2.7 J 1W		
R81 R81 R81 R84 R85	,82		* * * *	RS14DB3D100J RS14DB3D100J RS14KB3D100J RD14AB2E6R2JTS RD14AB2E6B0JTS	FL-PROMERS 10 J 2W FL-PROMERS 10 J 2W FL-PROMERS 10 J 2W FL-PROMERD 6.2 J 1/4W FL-PROMERD 68 J 1/4W	KPUM <u>UE</u> XE	
R86 R87 R88 R89 R89			* *	R92-0514-05 R514DB3A152J R514DB3A222J R514DB3D10OJ R514DB3D10OJ	FUSE RESIST 4.7 1/4W FL-FR00F RS 1.5K J 1W FL-PR00F RS 2.2K J 1W FL-PR00F RS 10 J 2W FL-PR00F RS 10 J 2W	KPUM <u>UE</u>	
R89 R91 VR1			* *	R\$14KB3D100J R\$14KB3A681J R12-4306-05	FL-PROOF RS 10 J 2W FL-PROOF RS 680 J 1W TRIMMING POT(50K) IDLE ADJ	XE	
RL1 S1			*	S51-2045-05 S29-1137-05	MAGNETIC RELAY ROTARY SLIDE SWITCH(SPEAKERS)		
D1 D2 D3 D4 D12	-11			D5FB10 D5FB20 V06C 1S2076A DSM1A1	DIODE DIODE DIODE DIODE		
			*	RD16E(B2) RD13E(B2) 1S2076A TA2041 TA2032	ZENER DIODE ZENER DIODE DIODE IC BUFFER, FINAL IC DRIVER		i se
105				UPC1237H	IC PROTECTION		

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Ref. No		Addres	ss N	ew	Parts No.	Descri	ption		Desti- nation	Re-
香照卷			Pa	arts 新	部品番号	部品名	/ 規	格		備考
01 ·2 03 ·4 05 ·6 07 ·8					250945(A)(Q,P) 25A733(A)(Q,P) 25A733(A)(Q,P) 2502631(R,S,T) DAT1018N	TRANSISTØR TRANSISTØR TRANSISTØR TRANSISTØR TRANSISTØR			1	1
011 > 1 013	2				DAT1018P () 25A988 25C2167(Y,G)	TRANSISTØR TRANSISTØR TRANSISTØR			# 0.10 1645 470.5	
014					PRE AMPLI	FIER (X08-2150	-00)			
D4 -5 D6 -8 D9					830-1012-05 830-0485-05 830-1010-05	LED(SLP-981C-50 LED(SLF-202B-01 LED(SLP-281F-50	.) INPI	MC UT		
01 ,2 03 -1 011 ,1 013 ,1 013 ,1	10 12 14				CC45FSL1H221J CC45FSL1H151J C91-0088-05 CK45FB1H561K CK45FB1H561K	CERAMIC 15 POLYSTY 10 CERAMIC 56	20PF 30PF 30PF 50PF 50PF	J K K K	XE XE KPUM UE	
013 +1 015 +1 017 +1 019 +2 021 +2	16 18 20			*:	CK45FB1H681K CK45FB1H222K C90-1281-05 CF92FV1H563J CF92FV1H153J	CERAMIC 22 ELECTRO 10 MF 0.	30PF 200PF 300UF . 056UF . 015UF		XE XE	
023 + 7 025 + 7 027 + 7 029 + 7 031 +	26 28 30			*	CF92FV1H392J CE04FW1H010MEL CF92FV1H103J	MF 3° ELECTRO 1.	. 3UF 900PF . OUF . 010UF 00UF	50WV J 50WV 25WV		
033 + 037 + 039 + 041	38				CEO4FW1E47OMEL CC45FSL1H221J CF92FV1H333J CEO4FW1E10OMEL CEO4FW1E10OMEL	CERAMIC 23 MF 0 ELECTRO 10	7UF 20PF . 033UF OUF OUF	25WV J J 25WV 25WV		
C43 + C45 - C49 - C53 + C55 +	-48 -52 -54		٠		CE04FW1E100MEL CF92FV1H183J CF92FV1H334J CC45FSL1H150J CF92FV1H104J	MF 0 D CERAMIC 1	OUF . 018UF . 33UF 5PF . 10UF	25WV J J J		
C57 , C59 , C61 C62 -	60			A CONTRACTOR OF THE PARTY OF TH	CK4SFB1H561K CC45FSL1H151J CEO4FW1H01OMEL CEO4FW1H01OMEL CEO4FW2A4R7MEL	CERAMIC 1 ELECTRO 1 ELECTRO 1	60PF 50PF . OUF . OUF . 7UF	K J 50WV 50WV 100WV	XE	
267				Will William	CK45FF1H103Z CK45FF1H103Z		), 01UF ), 01UF	Z Z		
E1 E2 E3					E13-0624-05 E13-0818-05 E13-0496-05	PHONO JACK(6P) PHONO JACK(8P) PHONO JACK(4P)	TAPE	A/B		
	.2 .4				L40-1011-43 L33-0275-05	SMALL FIXED IN	NDUCT81	R(100UH,K)	XE	
R25 R27 R29 VR1	, 28	28			RN14DK2E753J RN14DK2E304J RN14DK2E4991G R06-5099-05	RN 3	75K 300K 4. 99K (100KX	J~ 1/4W J 1/4W G 1/4W 2)VØLUME		

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Ref. No.	Address N	lew arts	Parts No.	Description	Desti- nation	Re- marks
参照番号		新	部品番号	部 品 名 / 規 格	仕 向	備考
VR2 VR3 •4	1B 1B	* *	R06-5125-05 R06-3042-05	POTENTIOMETER(200KX2)BALANCE POTENTIOMETER(10KX2) BASS, TREB		
51 52 53 54 55 •6	1C 2B 2B 2B 2B 1B,2B	*	\$90-0070-05 \$42-4038-05 \$40-6025-05 \$40-4045-05 \$40-2122-05	SLIDE SWITCH TAPE MØNITØR PUSH SWITCH(4KEY)INPUT SELECT PUSH SWITCH CARTRIDGE MM/MC PUSH SWITCH MUTING PUSH SW LØUDNESS.TØNE ØN/ØFF	1	
D1 ,2 D3 D10 -13 IC1 IC2		*	RD20J(B2) 1S2076A 1S2076A NJM5532D NJM2041D-D	ZENER DIODE DIODE DIODE IC OP AMP IC OP AMP		
Q1 -4 Q5 ,6 Q7 Q8 Q9 ,10			25K170(BL,V) 25K105(H) 25C2590(R,S) 25A1110(R,S) 25K105(H)	FET FET TRANSISTOR TRANSISTOR FET		
Q9 .10 Q9 .10 Q11 -14 Q11 -14			2SK105A(2) 2SK301(0) 2SK163(M,N) 2SK301(S)	FET FET FET FET		
			MODULATI	ON (X14-1640-00)		
C1 ,2		*	CE04FW1V100MEL	ELECTRO 10UF 35WV		
D1 -8 D9 ,10 Q1 -4 Q5 -8 Q9 -14		*:	1SS176 E-202 2SC1845(F+E) 2SA733(A)(Q+P) 2SC945(A)(Q+P)	DIØDE CØNSTANT CURRENT DIØDE TRANSISTØR TRANSISTØR TRANSISTØR		
Q15 ,16 Q17 ,18 Q19 ,20			25C2632(Q,R,S) 25A999(E,F) 25A1124(Q,R,S)	TRANSISTØR TRANSISTØR TRANSISTØR	Ì	

E: Scandinavia & Europe H:Audio Club K: USA

P: Canada

♠ indicates safety critical components.

S: South Africa

T: England

U: PX(Far East, Hawaii)

UE: AAFES(Europe)

X: Australia

M: Other Areas

#### Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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